CHAPTER 4
Vegetation Types, Habitat, and Species Descriptions

Vegetation Types and Habitats

Two sources of data describe and classify the vegetation types and plant habitats of NTM and neither source mapped the vegetation. As part of its Northern Sierra Nevada Foothills Project and in cooperation with CDFG, the California Native Plant Society conducted surveys and established the initial classifications of some of the vegetation types of NTM. These classifications are based on the California Vegetation Classification and Mapping Program (Sawyer and Keeler-Wolf 1995) and should be considered preliminary and subject to revision during the quality control and review process (A. Klein, personal communication). The second set of data was generated by Jim Jokerst, who conducted plant surveys on NTM from 1976 to 1982 and used his field experience to formulate 14 plant habitat types, based on vegetation composition, substrate type, and apparent wetness of the rock or soil (Jokerst 1983, Sacramento Valley Chapter of the California Native Plant Society 2003, Mackey and Bills 2004). These plant habitat types are primarily limited to the herbaceous communities on the top of NTM. A list of plant species recorded on NTM is attached as Appendix B. The California Wildlife Habitat Relationships System (CWHRS) (Meyer and Landenslayer 1988) provides habitat models that determine the potential wildlife species that may occur on NTMER. A list of wildlife species that are either known to occur or that are predicted to occur in habitats present on NTMER is provided in Appendix C.

Jokerst noted three reasons for the unusually high diversity of native plant species (287 taxa) present on NTM (Jokerst 1983). First, because of NTM's very shallow and rocky soils, agricultural disturbances (tilling, fertilization, and seeding of exotic species) have been minimal. Second, the extensive areas of exposed basalt or shallow soils over basalt provide habitats that permit plant species that are found on the floor of the Central Valley, such as white-flowered navarretia (*Navarretia leucocephala*), and species that are usually limited to higher elevation rocky soils, such as spreading navarretia (*Navarretia divaricata*), to coexist. Third, and what Jokerst considered to be the most important factor, there are a diversity of water and soil habitats available to the plant species for colonization. No floristic surveys have been done in the canyons or along the sides of NTM and the plant species in those areas have not been formally documented.

Because the distribution of plant species and the composition of vegetation are so closely linked to substrate and moisture regimes on NTM, it is difficult to separate vegetation types from plant habitat types (Photos 3-2, 3-4, 3-6, & 3-8). Additionally the habitat models of the CWHRS are more general than vegetation type or plant habitats and cross-walks between vegetation classification systems and CWHRS models are not always possible. Given these differences and constraints, each of the following classifications should be considered to be a habitat type unless it is explicitly classified as a vegetation type. Also, because the vegetation and habitats on NTM have not yet been completely characterized, it is unclear if published references to vernal pools refer exclusively to the Northern Basalt Flow Vernal Pools habitat or whether they implicitly include the frequently ponded swales of the Cobble and Swale Trains habitat described below. The reported locations of sensitive-status species, the field surveys by ESA staff in spring 2005, and the recently completed soil survey (Rust 2000, National Resource Conservation District 2006) all suggest that many references to vernal pools on NTM are actually references to the frequently ponded swales of the Cobble and Swale Trains habitat type.

Northern Basalt Flow Vernal Pools

Vernal pools are seasonally inundated wetlands that form during the wet season (Photo 3-2). Ponding in the pools occurs because the percolation of rainwater is blocked by an impermeable layer or barrier that causes a perched water table and the expression of vernal pools in depressions. The NTMER vernal pools are classified as Northern Basalt Vernal Pools because the top of the underlying basalt rock forms the impermeable barrier. On NTM, vernal pools are restricted to the Cherotable-Kramn soil complex (Appendix A), where the pools are underlain by the Cherotable soil series, while the adjacent uplands are underlain by the Kramn soil series. Jokerst's pool, wet margin, and low mound habitats are included within this habitat type. Vernal pool plants and animals are typically adapted to specific niches in the vernal pool system that are related to the duration or depth of inundation (Holland and Dains 1990, Simovich 1998). On NTM, common plant species in vernal pools include Fremont's goldfields (*Lasthenia fremontii*); bracted popcorn flower (*Plagiobothrys bracteatus*); toothed downingia (*Downingia cuspidata*); water pygmyweed (*Crassula aquatica*); turkey mullein (*Eremocarpus setigerus*); white-flowered navarretia; and seep monkey flower (*Mimulus guttatus*). While the pools are dominated by native plant species, the vegetation of the adjacent upland areas is dominated by non-native grasses such as soft chess and a varying mixture of herbaceous native species such as fringepod (*Thysanocarpus curvipes*).

Cobble and Swale Trains

Cobble and Swale Trains habitat is primarily restricted to the Rock Outcrop-Thermalrocks-Campbellhills Complex, 2-15% slopes (Appendix A), and includes Jokerst's dry cobbles, wet cobbles, wet margin, and thick soil habitats. The characteristic, almost wave-like, alternating pattern of this habitat type is clearly visible in aerial photographs of NTM (Figure 2, Photo 3-3) and in vegetation differences (Photo 3-4). The highest areas of the cobble trains are typically

lightly vegetated with Hansen's spike moss, blue dicks, and annual fescue, while the lower areas are thickly blanketed with Hansen's spike moss. Yellow carpet is common in the wet margins of the cobble trains, while the swales are dominated by non-native grasses such as soft chess and a varying mixture of native herbaceous species that includes sky lupine. Butte County golden clover occurs almost entirely within the swales of this habitat type (Photo 4-1).

Photo 4-1: Butte County Golden Clover, April 2005

Basalt Outcrops

The vegetation of basalt outcrops is variable because of the diversity of the rock substrate and moisture regimes. Jokerst's rock outcrop, outcrop edge, thin soil, fractured basalt, and cliff face habitats are included in this type. Characteristic plants of these habitat types include blue dicks; annual fescue; Hansen's spike moss; bitterroot (*Lewisia rediviva*); volcanic onion (*Allum cratercola*); bladder lomatium (*Lomatium utriculatum*); woody mountain jewel-flower (*Strepthantus tortuosus*); California manroot (*Marah fabaceus*); canyon dudleya (*Dudleya cymosa*); and lace lip fern (*Cheilanthes gracillima*).

Non-Native Grassland

The vegetation of areas with thicker soils on NTM is typically dominated by non-native annual grass species but may also support a relatively large number of native plant species. Spatially, this vegetation type can form relatively homogeneous areas, but it is often present as an inclusion within various habitat types such as on the mounds adjacent to vernal pools and in the swales

of the cobble and swale trains. The term *thicker soil* is used to emphasize the fact that soil depth is controlled by the upper surface of the basalt and that depth may be increased upwards or downwards. For example, the tops of mounds have thicker soils relative to the top of the basalt surface while soils in swales are thick because they form in deep fractures below the general surface of the basalt. Common non-native annual grass species include soft chess; lesser quaking grass (*Briza minor*), medusa-head (*Taeniatherum caput-medusae*); and slender wild oat (*Avena barbata*). Common native species include poison sanicle (*Sanicula bipinnatifida*); common fiddleneck (*Amsinckia menziesii*); and tomcat clover (*Trifolium willdenovii*).

Blue Oak Woodland

Blue Oak Woodland vegetation is found along the edge of the mesa, comprises about 20 percent of the vegetation of NTMER, and is dominated by blue oak. A few other native woody species are present, such as foothill pine and white-leaved manzanita (*Arctostaphylos vicida*), but the understory is typically dominated by annual species that include the native miner's lettuce (*Claytonia perfoliata*) and the non-native ripgut brome grass (*Bromus diandrus*).

Mixed Oak Woodland and Forest

This vegetation type is found along the sides and bottoms of the canyons and is dominated by interior live oak and western poison oak. Other native tree species present include blue oak; black oak (*Quercus kelloggii*); valley oak (*Quercus lobata*), canyon live oak (*Quercus chrysolepis*); California bay; California buckeye (*Aesculus californica*); madrone (*Arbutus menziesii*); and ponderosa pine (*Pinus ponderosa*) (Photo 3-8).

Northern Mixed Chaparral

Northern Mixed Chaparral vegetation is found along the edges of the canyons and typically consists of shrubby individuals of interior live oak and western poison oak. This vegetation type may be due to the regrowth of stump-sprouting trees that were cut during the mining period and that had been previously managed through the use of prescribed burns (T. York, personal communication).

Intermittent Riverine

This habitat type is present in Gold Run Creek in Coal Canyon and in Campbell Creek in Beatson Hollow. The streams begin flowing in the fall soon after the start of the wet season and may continue to flow into June. During the summer and fall, the only water present in the creeks is in a few pothole pools and near small springs.

Lacustrine

The only habitat of this type is a stock pond on top of NTM that lies partially within the boundaries of the NTMER.

Special-Status Species

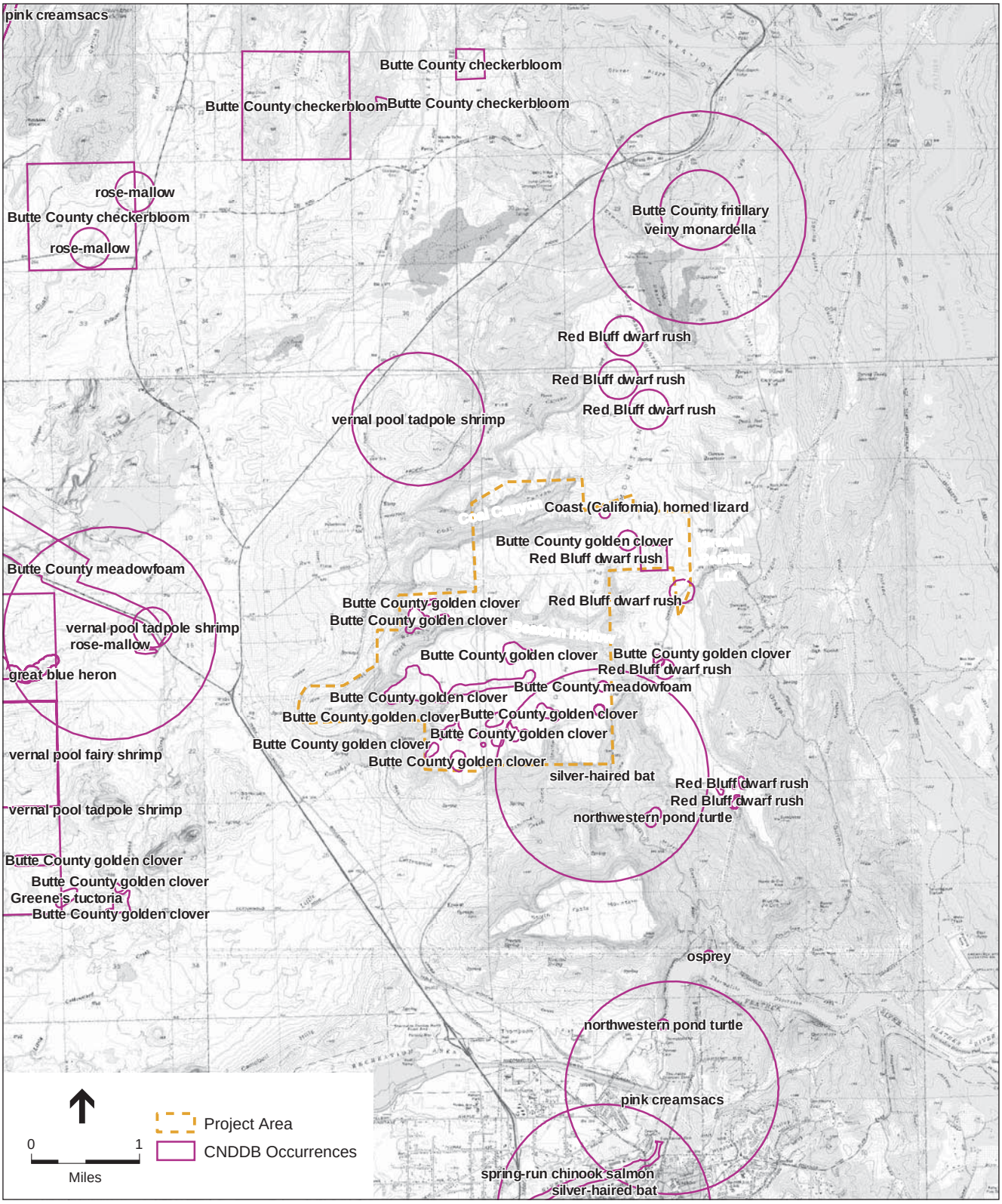
The list of federal endangered and threatened species compiled by the Sacramento office of the United States Fish and Wildlife Service (United States Fish and Wildlife Service 2005a), the Natural Diversity Database of the CDFG (California Department of Fish and Game 2006), and the CNPS Inventory of Rare and Endangered Plants (California Native Plant Society 2006) were consulted for sensitive species occurrences at NTMER (Figure 4 & Appendix D). The geographical range of the occurrence data includes the USGS Oroville 7.5-minute quad and the surrounding eight quads. Additionally, the published list of the Table Mountain flora was consulted for potential special-status species (Jokerst 1983, Sacramento Valley Chapter of the California Native Plant Society 2003, Mackey and Bills 2004).

Brief descriptions of sensitive-status plant and wildlife species that are know to occur on NTMER follow. Additional information for special-status species, including species with potential to occur on NTMER, is provided in Appendix D.

Plant Species

Butte County Meadowfoam

Butte County meadowfoam is a small annual plant with inconspicuous flowers that is included on both the federal and California endangered species lists (United States Fish and Wildlife Service 2005b). It is a rare subspecies that is related to the more widely distributed woolly meadowfoam (*Limnanthes floccose* ssp. *floccose*). A significant amount of research has been conducted on this subspecies so that some of its environmental requirements and life history traits are relatively well described. Its current and historical distribution is restricted entirely to Butte County and is roughly within the State Highway 99 corridor from NTM to just north of Rock Creek. It has been reported sporadically from NTMER (1973, 2005). Butte County meadowfoam is not adapted to long-duration flooding and is typically found along the high water mark of vernal pools and along the bottoms of swales. This makes its populations vulnerable to non-native invasive species (NIS), such as medusa-head grass, which produces dense layers of thatch. Conservation actions require reducing the thatch through appropriate grazing management (Griggs 2000, Marty 2005, United States Fish and Wildlife Service 2005b). In 2005, the NTMER population was associated with white-flowed navarretia, Freemont's goldfields (*Lasthenia fremontii*), white-tipped clover (*Trifolium varigatum*), and coyote thistle (*Eryngium castrense*) and was found in a broad swale or shallow vernal pool on the Eisley-Beatsonhollow-Campbellhills-Rock Outcrop soil complex.



SOURCE: USGS, 1993; CNDDB, 2006; and ESA, 2006

North Table Mountain Ecological Reserve . 204427

Figure 4

CNDDB Occurrences

Butte County Golden Clover

This small annual clover is a CNPS 1B species that is only found on NTM and along Cottonwood Road immediately west of NTM. Surveys of the NTMER by ESA staff located many large populations that were primarily confined to the bottoms of swales. As was the case with Butte County meadowfoam, this environmental requirement makes its populations vulnerable to thatch accumulation driven by NIS species such as medusa-head grass and appropriate grazing management is a required conservation action (Griggs 2000, Marty 2005, United States Fish and Wildlife Service 2005b). On NTM, this subspecies is found in swales with fluctuating ponding on the Rock Outcrop-Thermalrocks-Campbellhills and Eisley-Beatsonhollow-Campbellhills-Rock Outcrop soil complexes.

Red Bluff Dwarf Rush

This small grass-like plant is a CNPS 1B subspecies that favors relatively unvegetated areas along the upper margins of vernal pools according to collection records (Ahart 2003). Very little else is known about this subspecies. On NTM, this subspecies is found in swales with fluctuating ponding on the Eisley-Beatsonhollow-Campbellhills-Rock Outcrop soil complex.

Animal Species

Coast Horned Lizard

California horned lizard is a large gray, tan, or reddish-brown lizard with a spiny head and two parallel rows of pointed scales running along each side of its body (Jennings and Hays 1994). It is endemic to California with a patchy distribution in the Central Valley from Shasta County south to the Peninsula Range. It is also found in both the inner and outer South Coast Ranges. Adults emerge from hibernation in late March and are active until July when they aestivate until August when they briefly emerge and then disappear into overwintering sites. Their daily diurnal activity is driven by thermoregulation requirements. They typically emerge just before sunrise from their burial sites in the soil and begin basking. As their body temperature increases they thermoregulate by either shifting the orientation of their bodies relative to the sun or moving in and out of the shade. During the warmest part of the day, California horned lizard covers itself with loose soil to stay cool. They have high site fidelity because effective temperature regulation requires that they be familiar with their surroundings. In the later afternoon, individuals re-emerge from the substrate and resume their activities. California horned lizards prey on beetles and native ants and probably take many other species of insects when those prey are seasonally abundant. It occurs in a wide variety of habitats that possess the critical resources of loose soils and structure for thermoregulation.